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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,433	12/28/2001	Young-Sang Byun	3430-0175P	4398
2292	7590	01/24/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			DUONG, THOI V	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/028,433

Applicant(s)

BYUN ET AL.

Examiner

Thoi V. Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6-10 and 12-16 ~~is/are~~ pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6-10 and 12-16 ~~is/are~~ rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This office action is in response to the Amendment filed November 07, 2005.

Accordingly, claims 1, 2, 6, 9, 10, 12 and 14-16 were amended, and claims 3, 5 and 11 were cancelled. Currently, claims 1, 2, 4, 6-10 and 12-16 are pending in this application.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1 and 9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

3. Claim 7 is objected to because of the following informalities: claim 7 recites the limitation "the sealed pattern" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 4, 6, 9, 10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Gutfeld et al. (von Gutfeld, USPN 6,055,035) in view of Nagato et al. (Nagato, USPN 5,619,234).

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Re claim 1, as shown in Figs. 2A, 2B and 3, von Gutfeld discloses a method of forming a liquid crystal layer on a substrate, comprising:

preparing a liquid crystal material in a projecting portion 20 comprising a LC source 23;

applying a pressure to the projecting portion 20 so as to emit the liquid crystal material (col. 5, lines 11-65);

moving the substrate 1A in one direction (col. 6, lines 8-14); and

depositing the liquid crystal material from the projection portion 20 uniformly onto the substrate during the moving of the substrate in the one direction (col. 5, lines 30-37).

Re claim 9, as shown in Figs. 1, 2A, 2B and 3, von Gutfeld discloses an apparatus for forming a liquid crystal layer on a substrate, comprising:

a projecting portion 20 having a nozzle plate 21 containing a nozzle aperture 22 for emitting a liquid crystal material; and

a stage 1 for moving the substrate 1A in one direction during emitting of the liquid crystal material from the projecting portion 21 uniformly onto the substrate (col. 5, 30-37 and col. 6, lines 8-14).

Von Gutfeld discloses a method of forming a liquid crystal layer on a substrate that is basically the same as that recited in claims 1 and 9 except for a resonator for applying an on voltage during emitting of the liquid crystal material to generate a vibration so as to apply a pressure to the projecting portion to emit the liquid crystal material from the projection portion.

As shown in Fig. 8, Nagato discloses an ink-jet system comprising a resonator 43 (piezoelectric element) mounted on a projecting portion 44 (ink-holding section) and electrically connected to a pulse generator 45 to apply an on voltage to a resonator 43 during emitting of the liquid crystal material to generate a vibration so as to apply a pressure to the projecting portion 44 to emit the ink droplets from the projection portion 44 (col. 13, lines 12-41), wherein a resonating plate is the top of the projecting portion 44 located between the resonator 43 and the projection portion 44 for transmitting the vibration to the projection portion 44 (col. 5, lines 35-41).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of forming a liquid crystal layer on a substrate of von Gutfeld with the teaching of Nagato by employing a resonator for generating a vibration upon application of an on voltage during emitting of the liquid crystal material so as to accomplish the emission with high controllability (col. 13, lines 31-34).

Re claims 2 and 10, as shown in Fig. 2A, von Gutfeld discloses that the projecting portion 20 has a nozzle plate 21 (fixture) containing a plurality of orifices 22, said nozzle plate adjusting the applied pressure for emitting the liquid crystal material, the liquid crystal material being emitted through the plurality of orifices (col. 5, lines 30-58 and col. 7, lines 47-55).

Re claims 4 and 13, von Gutfeld discloses that the liquid crystal material is emitted and deposited in a vacuum chamber 60 (Figs. 6 and 7, and col. 7, lines 36-55);

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accordingly, it is obvious that the vacuum chamber encompasses the projection portion, the resonator and the resonating plate used to emit the liquid crystal material.

Re claims 15 and 16, as shown in Figs. 2B and 3 of von Gutfeld, the volume of the emitted liquid crystal material is adjusted by a CPU 25 to obtain the correct a correct amount of the liquid crystal material deposited on the panel 1A according to a position of the nozzle plate 21 or the moving substrate (col. 5, line 50 through col. 6, line 14). Accordingly, it is obvious that the CPU 25 is operated by an on voltage according to a position of the nozzle plate 21 or the moving substrate so as to allow a uniform amount of the liquid crystal material to be ejected through the nozzle plate (col. 5, line 50 through col. 6, line 14).

Re claim 6, as shown in Fig. 8 of Nagato, since the resonator 43 is mounted on the top of the projecting portion 44, the generated vibration is transmitted to the projecting portion 44 through the top of the projecting portion which is considered as a resonating plate (col. 13, lines 35-41).

Re claim 12, as shown in Fig. 3, since von Gutfeld discloses that the stage 1 is moved in relation to a fixed projection portion 20 (col. 6, lines 8-14), it is obvious that means is provided for moving the stage.

Re claim 14, as shown in Fig. 7, Nagato discloses that means 44 (pulse generator) is provided for generating vibration in the resonator 43 (col. 13, lines 17-34).

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Gutfeld et al. (von Gutfeld, USPN 6,055,035) in view of Nagato et al. (Nagato,

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USPN 5,619,234) as applied to claims 1, 2, 4, 6, 9, 10 and 12-16 above, and further in view of Masazumi et al. (Masazumi, USPN 6,331,884 B1).

As shown in Fig. 4, von Gutfeld discloses at least one of the substrates, 1A or 1B, having a sealed pattern 41 (col. 7, lines 24-27). However, von Gutfeld as modified in view of Nagato does not disclose a black matrix formed under the sealed pattern, wherein the liquid crystal material start and stop is deposited on the black matrix as recited in claims 7 and 8.

As shown in Fig. 5, Masazumi discloses a black matrix 8 (black light absorbing layer) formed under a sealed pattern 9b' (col. 16, lines 18-23), wherein a liquid crystal material 9a, 9a', 9a'' start and stop is deposited on the black matrix.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of von Gutfeld with the teaching of Masazumi by forming a black matrix under a sealed pattern for enabling display of a black which is background color when the liquid crystal is transparent (col. 10, lines 1-10).

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within


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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong



01/21/2006

  
ANDREW SCHECHTER  
PRIMARY EXAMINER